# Analysis of The Use of Transportation Modes in Crude Oil Distribution at PT BBS Bojonegoro

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***Abstract***

The management of oil and gas resources must be optimized to ensure efficiency, transparency, sustainability, and fairness, aiming to enhance public welfare. Oil distribution through transportation systems plays a crucial role in improving regional income and economic growth. SWOT analysis serves as a strategic tool to assess internal strengths and weaknesses alongside external opportunities and threats, helping organizations formulate appropriate strategies. The analysis identified key internal strengths such as a strong reputation, quality service, and HSE compliance, while weaknesses include outdated fleet technology and inconsistent operations. Externally, opportunities arise from the availability of transport providers and supportive regulations, whereas threats include market restrictions and fluctuating tariffs. The company is positioned in SWOT Quadrant II, suggesting a differentiation strategy focused on service diversification and agribusiness expansion. SO strategies leverage internal strengths to seize external opportunities; WO strategies address weaknesses through modernization; ST strategies apply strengths to mitigate threats; and WT strategies reduce vulnerabilities through operational improvements and strategic adjustments.

***Keywords:*** *Differentiation strategy; Oil distribution; Operational efficiency; Strategic planning; SWOT analysis*

## 1. Introduction

The state's power over the earth, water, and natural resources therein aims to utilize them to the greatest extent for the prosperity of the people. In the context of oil and natural gas, which are non-renewable natural resources, their management must be carried out optimally, efficiently, transparently, sustainably, and environmentally aware, as well as fairly. The goal is to ensure maximum utilization for the sake of sustainable prosperity of the people [1]. Petroleum has a vital and strategic role in everyday human life, and it is used as raw material for industry and primary energy sources. Because oil and gas are non-renewable natural resources, the use and extraction of oil and gas reserves and their distribution must be planned carefully, efficiently, and economically [2]. This is crucial considering the role of transportation modes that are greatly needed by today's petroleum mining efforts [3]. By implementing petroleum distribution activities through transportation modes from petroleum mining locations, it is hoped that the delivery process to storage/storage sites can be facilitated so that it can increase the income and welfare of the community in the area, which will ultimately contribute to the increase in the local economy [4].

## 2. Method

SWOT analysis was first introduced by Andrew in 1965 with the aim of helping companies formulate strategies based on the results of evaluations of internal and external factors [5]. Internal factors include strengths and weaknesses, while external factors include opportunities and threats. By evaluating these factors, companies can develop strategies that maximize strengths and opportunities and minimize weaknesses and threats faced [6]. The application of SWOT analysis has been widespread

in various studies, including environmental performance analysis [7]- [8], as well as innovation in electronic commerce applications [9].

The SWOT matrix provides a mechanism that facilitates the relationship between a company's strengths and weaknesses (internal factors) and its opportunities and threats (external factors) [10]. It provides a framework for identifying and formulating strategies, as shown in Figure 1. The SWOT matrix is a significant tool in helping managers develop four main types of strategy, namely:

1. SO Strategy (strengths-opportunities)
   The company's strategy is to use internal strengths (S) to take advantage of external opportunities (O) [11]- [12].
2. WO (weaknesses-opportunities) strategy
   The company's strategy is to take advantage of external opportunities (O) to reduce internal weaknesses (W) [11]- [12].
3. ST Strategy (strengths-threats)
   The company's strategy is to use internal strengths (S) to reduce or avoid external threats (T) [11]- [12].
4. WT (weaknesses-threats) strategy
   Strategies used by companies to reduce internal weaknesses (W) and prevent external threats (T) [11]- [12].

## 3. Results and Discussion

Internal factors, which encompass a company’s strengths and weaknesses , refer to conditions originating within the organization and are subject to the direct control and influence of management. The identification of these factors necessitates active participation from internal stakeholders. Relevant data is typically gathered through the involvement of key personnel, including financial managers, operational managers, transportation staff, and administrative staff. Conversely, external factors classified as threats and opportunities are elements that originate from the external environment and lie beyond the direct control of management. Despite this, they exert a significant impact on the achievement of the organization's strategic objectives. The identification of external factors involves a systematic evaluation of environmental dynamics, which includes political, economic, social, technological, regulatory, and market-related dimensions. It provides a framework for identifying and formulating strategies, as shown in the Table 1.

Table 1. SWOT Analysis

| Internal / External | Strength (S) | Weakness (W) |
|---|---|---|
| | 1. The company has a good reputation among consumers<br>2. The company always provides the best service to consumers<br>3. The capacity of the transportation fleet is ideal to support product availability.<br>4. The number of fleets is very large fulfill<br>5. The transport fleet is still very suitable in terms of vehicle age.<br>6. The vehicle owner bears fleet maintenance and operational costs<br>7. The transport fleet follows HSE requirements properly | 1. There is a difference in the quality of crude oil carried by the transport fleet.<br>2. The transport fleet is often not operational<br>3. The transport fleet still uses standard truck body technology |

Table 1. SWOT Analysis (continuous)

| Opportunity (O) | SO Strategy | WO Strategy |
|---|---|---|
| 1. There are many transportation fleet providers<br>2. Regulatory developments are always socialized first<br>3. Only a single transporter permit is granted for transporting crude oil in certain WKs<br>4. The safety of crude oil delivery activities is guaranteed with a local content cooperation system.<br>5. Transporter reliability in taking crude oil in various fields and weather conditions | 1. Leveraging Reputation and Best Service to Strengthen Position as Single Transporter<br>2. Optimizing Capacity and Fleet Size to Capture Market Opportunities<br>3. Using a Suitable and HSE-Compliant Fleet to Meet Evolving Regulations<br>4. Building Partnerships with Fleet Providers and Local Content for Delivery Security<br>5. Using the Advantages of Owner-Assured Fleet Maintenance to Keep Efficiency Operational | 1. Replacing or Upgrading Transportation Fleet Technology<br>2. Optimizing Collaboration with Fleet Providers to Minimize Downtime<br>3. Improving Crude Oil Quality Monitoring System<br>4. Leveraging Regulatory Developments to Improve Fleet Standards<br>5. Strengthening Delivery Reliability through Local Content Cooperation |
| Threat (T)<br>1. Delivery of crude oil is only permitted to certain consumers according to the Work Area contract.<br>2. Prices/Fleet Usage Rates given follow the latest oil prices | ST Strategy<br>1. Strengthening Relationships with Consumers of Working Area Contracts<br>2. Negotiating Tariffs with Consumers Based on Quality Services<br>3. Diversifying Services to Reduce Dependence on Certain Working Area Contracts<br>4. Optimizing Operational Efficiency to Balance Fluctuations in Oil Tariffs<br>5. Implementing More HSE Safety and Compliance Standards Good as a Competitive Advantage | WT Strategy<br>1. Improving the Quality of Crude Oil Management in Transportation<br>2. Rejuvenating and Upgrading Fleet Technology<br>3. Better Fleet Maintenance and Management<br>4. Optimizing Routes and Fleet Operations to Reduce Costs<br>5. Renegotiating Contracts for Tariff Flexibility<br>6. Collaborating with Providers More Advanced Technology Fleet |

The input stage requires strategists to measure subjectivity during the early stages of the strategy formulation process. Decision-making at this input stage concerns the relative importance of internal and external factors that allow strategists to generate and evaluate alternative strategies more effectively. Good intuitive judgment is always required in determining weights and ratings.

### 3.1 *Internal Factor Evaluation (IFE) Matrix*

In the preparation of the Internal Factor Evaluation (IFE) Matrix, weights and ratings are assigned to systematically assess the strengths and weaknesses of an organization's internal factors. The weight indicates the level of importance of each factor, using a scale from 0.0 to 1.0, with the

total sum of all weights equaling 1.0. The rating is given based on the organization's ability to respond to each factor, on a scale from 1 to 5, where 5 represents a very strong response and 1 represents a very weak response. The weighted score is calculated by multiplying the weight and rating of each factor, and then summing these values to obtain the total IFE score. This score serves as the basis for evaluating the internal condition of the organization, whether it is strong (score > 2.5) or weak (score < 2.5), and aids in the formulation of appropriate strategies. The IFE Matrix summarizes and evaluates strengths and weaknesses in functional areas of business and also serves as a basis for identifying and assessing relationships between areas.

Table 2.Strengths

| Strengths | Weight | Rating | Score |
|---|---|---|---|
| The company has a good reputation among consumers | 0.15 | 4.5 | 0.7 |
| The company always provides the best service to consumers | 0.15 | 4.6 | 0.7 |
| The capacity of the transport fleet is ideal for supporting product availability | 0.14 | 4.3 | 0.6 |
| The number of fleets is sufficient | 0.14 | 4.4 | 0.6 |
| The transport fleet is still very suitable in terms of age vehicle | 0.13 | 4.0 | 0.5 |
| The owner bears fleet maintenance and operational costs vehicle | 0.14 | 4.3 | 0.6 |
| The transport fleet complies with HSE requirements properly | 0.14 | 4.3 | 0.6 |
| Average | 1 | | 4.3 |

Table 3. Weaknesses

| Weaknesses | Weight | Rating | Score |
|---|---|---|---|
| There is a difference in the quality of crude oil carried by the transport fleet | 0.36 | 2.9 | 1.0 |
| The transport fleet is often not operational | 0.16 | 1.3 | 0.2 |
| The transport fleet still uses standard technology truck bodywork | 0.48 | 3.9 | 1.9 |
| Average | 1 | | -3.1 |

### 3.2 *External Factor Evaluation (EFE) Matrix*

The External Factor Evaluation (EFE) Matrix is developed to systematically assess an organization's ability to respond to opportunities and threats from the external environment. Each external factor is assigned a weight based on its level of importance, using a scale from 0.0 to 1.0, with the total weight summing to 1.0. A rating is then provided to indicate the effectiveness of the organization's response to each factor, using a scale from 1 to 5, where a rating of 1 reflects a very low response and a rating of 5 indicates a very high response. The weighted score is calculated by multiplying the weight and rating, and the values are summed to obtain the total EFE score. This score is used to evaluate the strategic position of the organization relative to the external environment; scores above 2.5 indicate a strong response, while scores below 2.5 highlight weaknesses in addressing external factors. The matrix serves as a foundation for the formulation of adaptive, environment-based organizational strategies. Strategists use the EFE Matrix to summarize and evaluate political, economic, social, technological, competitor, new entrant, substitute product, supplier bargaining power, and buyer bargaining power information.

Table 4. Opportunities

| Opportunities | Weight | Rating | Score |
|---|---|---|---|
| There are many transportation fleet providers | 0.11 | 1.9 | 0.2 |
| Regulatory developments are always socialized first | 0.24 | 4.2 | 1.0 |
| Only a single transporter permit is granted for transportation crude oil in certain WK | 0.23 | 3.9 | 0.9 |
| The system guarantees the safety of crude oil delivery activities | 0.24 | 4.1 | 1.0 |
| local content collaboration | | | |
| Reliability of transporters in taking crude oil at various field conditions and weather | 0.19 | 3.3 | 0.6 |
| Average | 1 | | **3.7** |

Table 5. Threats

| Threats | Weight | Rating | Score |
|---|---|---|---|
| Crude oil shipments are only permitted to certain consumers according to the Work Area contract | 0.49 | 4.0 | 2.0 |
| Fleet Usage Prices/Tariffs given follow the prices latest oil | 0.51 | 4.1 | 2.1 |
| | 1 | | **-4.0** |

Based on the calculation results, the following SWOT matrix was obtained:

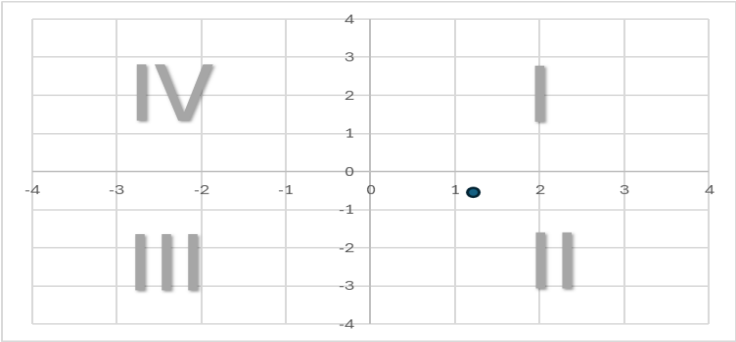


Figure 1. Calculation Results, Obtaining SWOT Matrix

Figure 1, represents the results of a quantitative SWOT mapping in a four-quadrant graph to determine the direction of the organization's strategy. The horizontal axis (X) represents the total score of the IFE Matrix, indicating the organization's internal strengths (positive) or weaknesses (negative). Meanwhile, the vertical axis (Y) represents the total score of the EFE Matrix, reflecting the organization's ability to respond to external opportunities (positive) or threats (negative). The combination of values on both axes divides the graph into four strategic quadrants: Quadrant I (aggressive), Quadrant II (diversification), Quadrant III (defensive), and Quadrant IV (turnaround). The position of the coordinate point on the graph indicates the most appropriate strategic direction based on the quantitative evaluation of internal and external factors.

Quadrant 1

One of the recommendations for a differentiation strategy is diversification of energy transportation services. in the Journal of Energy Transportation explains that crude oil transportation companies can develop other energy transportation services, such as liquefied natural gas (LNG) and renewable fuels such as biofuels [13]. This diversification of services allows the company to leverage existing infrastructure, while reducing dependence on volatile crude oil in terms of prices and increasingly

stringent environmental regulations [14]. This move will give the company a more flexible position in dealing with changes in global energy demand [15]. In addition to service diversification, technological innovation is another key factor in differentiation strategy. The use of advanced technologies such as intelligent pipe sensors and monitoring automation systems can improve operational efficiency and safety. This technological innovation allows companies to reduce operational risks such as leaks.

Quadrant 2

The results of the SWOT analysis show that the company is in Quadrant 2, which indicates solid internal strength. On the other hand, the company also faces quite significant external challenges. To overcome this situation, it is recommended that the company adopt a Differentiation strategy as an approach to facing competition in a competitive market. The SWOT analysis reveals that the company is in Quadrant 2, which indicates significant internal strength, but is faced with external challenges that cannot be ignored. One of the main challenges is the potential for decreasing oil reserves, which could result in a decrease in demand for oil distribution services [16]. In this condition, the recommended strategy is Differentiation, which not only emphasizes improving current services but also leads to business diversification by exploring new business opportunities.

### 3.3 *Differentiation Strategy with a Focus on Business Diversification*

Companies that initially focus on petroleum distribution can adopt a differentiation strategy by expanding their business into sectors such as agriculture, plantations and livestock. Following are the steps you can take:

1. Market analysis and needs of the agriculture, plantation and livestock sectors
    a. Identify Transportation Needs. This can be done by conducting research to understand specific transportation needs in these sectors, for example shipping crops, distributing livestock products, or transporting agricultural materials such as fertilizer and seeds [17].
    b. Trend and Demand Analysis. Understand the growth trends of this sector, including changes in consumption patterns, increasing food needs, and export potential [5]- [18].
2. Diversification of Transportation Services
    a. Fleet Modifications. Adapt or add to the truck fleet that is suitable for transporting products from the agricultural, plantation and livestock sectors, such as refrigerated trucks for livestock products or special trucks for transporting raw materials [3]- [12].
    b. Integrated Logistics Services. Providing logistics services which include transportation, storage, packaging and distribution of products from farms or plantations to markets [9].
3. Development of Strategic Partnerships
    a. Collaboration with Local Farmers and Plantations. Establish partnerships with farmer groups, cooperatives and agribusiness companies to provide integrated transportation services from upstream to downstream [11] -[15].
    b. Collaboration with Agricultural Institutions. Collaborate with educational institutions or agricultural institutions to understand the latest technology and logistics needs in this sector [14].
4. Application of Technology to Support Differentiation
    a. Transportation Monitoring and Management Technology. Using technology such as IoT and fleet management systems to monitor product conditions during transportation, especially for perishable goods [8].
    b. Process Automation and Digitalization. Automation in logistics for route mapping, delivery scheduling, and inventory management to increase efficiency and timeliness [11].

5. Development of Additional Products and Services
    a. Unified Storage Services. Providing cold storage facilities or silos for agricultural and livestock products to simplify the distribution process [6].
    b. Demand Based Distribution Services. Providing flexible distribution services that can be adjusted to fluctuating market demand and customer needs [15].
6. Rebranding and Tailored Marketing
    a. Innovative and Diverse Company Image. Carrying out rebranding to introduce the company as a provider of transportation and logistics solutions that also has expertise in the agribusiness sector [18].
    b. Targeted Marketing Strategy. Develop marketing strategies aimed at new customers in the agribusiness sector by highlighting the superiority of the services offered [3]- [8].
7. Human Resources Development
    a. Special Training. Provide training for drivers and logistics staff in handling agricultural and livestock products, which require different treatment from petroleum products [2].
    b. Addition of Expert Staff. Recruit experts in the agribusiness sector to help companies understand market and logistics needs in this sector [4]- [12].
8. Continuous Evaluation and Adjustment
    a. Performance Monitoring: Conduct regular evaluations of the performance of this new service based on customer feedback and operational analysis [6].
    b. Adaptation to Market Changes. Adapting strategies and services to changing market conditions and needs in the agricultural, plantation and livestock sectors [9]- [18].

Differentiation strategy that focuses on business diversification into the agricultural, plantation and livestock sectors, companies can open new sources of income, reduce dependence on the oil industry, and take advantage of growth opportunities in these important sectors. This approach allows companies to remain competitive amidst changing market and business conditions.

## 4. Conclusion

The management of oil and natural gas resources must be carried out in an optimal, efficient, transparent, sustainable, and equitable manner to maximize public welfare. The distribution of crude oil through transportation modes from extraction sites to storage facilities is expected to enhance regional income and community well-being while stimulating local economic growth. SWOT analysis is a strategic method used to evaluate internal factors (strengths and weaknesses) and external factors (opportunities and threats) to support organizations in formulating effective strategies. The SWOT matrix provides a structured framework for identifying and developing four main types of strategies SO, WO, ST, and WT to optimize organizational potential while minimizing risks.

Based on the SWOT analysis, the company's internal strengths include a solid reputation, superior service quality, and compliance with Health, Safety, and Environmental (HSE) standards. Conversely, internal weaknesses include outdated fleet technology and operational inconsistencies. Externally, opportunities are identified in the availability of multiple transport providers and supportive regulatory conditions, while threats include restricted customer access due to work area contracts and fluctuating oil transport tariffs. The results position the company in Quadrant II, indicating a need for differentiation strategies. These strategies focus on diversifying energy transport services and expanding into agribusiness sectors, supported by technological innovation, strategic partnerships, and human resource capacity development.

The SO strategy emphasizes leveraging internal strengths such as reputation, service quality, and adequate fleet capacity to capture external opportunities by building strategic partnerships and strengthening the company's position as a sole transporter through reliable service. The WO strategy seeks to address internal weaknesses, such as outdated technology and irregular operations, by modernizing the fleet, enhancing oil quality monitoring systems, and capitalizing on regulatory developments to support modernization. The ST strategy aims to utilize the company's strengths in responding to external threats by reinforcing relationships with contract-based clients, diversifying service offerings, and implementing stringent safety standards as a competitive advantage. Meanwhile, the WT strategy focuses on mitigating internal weaknesses and external threats through fleet rejuvenation, operational optimization, and contract renegotiation to increase flexibility and resilience.

## Reference


[1] Rumokoy, Nike K. (2016). Pelanggaran Hukum terhadap Penggunaan Minyak dan Gas Bumi (Migas) yang Terkandung di dalam Wilayah Hukum Pertambangan Indonesia oleh Pihak yang Tidak Berwenang oleh: Nike K. Rumokoy. *Jurnal Hukum Unsrat, 22*(5), pp. 81-92.

[2] Ardiansah, Nur, and I. Nyoman Pujawan. (2024). Risk Management for the Petrodiesel-Biodiesel Fuel Blend Supply Chain in Indonesia. *IOP Conference Series: Earth and Environmental Science,* 1344(1). IOP Publishing.

[3] Arwini, Ni Putu Decy, and I. Made Juniastra. (2023). Peran Transportasi Dalam Dunia Industri. *Jurnal Ilmiah Vastuwidya (6)*1, 70-77.

[4] Supardi, E., & Sianturi, R. C. (2020). Metode saving matrix dalam penentuan rute distribusi premium di Depot SPBU Bandung. *Jurnal Logistik Bisnis, 10*(1), 89-98.

[5] Hanum, W. N. (2020). *Model Pengelolaan Pertambangan Minyak Bumi Berdasarkan Prinsip Keadilan Sosial (Studi Pemanfaatan Sumur Tua Secara Tradisional di Lapangan Minyak Desa Wonocolo, Kabupaten Bojonegoro)*.

[6] Hadilinatih, B. (2018). Implementasi Kebijakan Pengelolaan Penambangan Minyak Bumi Secara Tradisional di Langkat. *Jurnal Enersia Publika: Energi, Sosial, dan Administrasi Publik*, 1(2).

[7] Atikah, N., & Sutopo, W. (2014). Simulasi model dinamik pengangkutan crude palm oil (cpo) di pt. xyz untuk meminimalkan biaya transportasi pengadaan bahan. *J@ ti Undip: Jurnal Teknik Industri, 9*(2), 125-134.

[8] Liperda, R. I., Hardianti, I. K., Widyah, I. N., Rahmadini, A., Fadjri, N. A., & Agustin, R. R. (2022). Simulasi-Optimasi Sistem Transportasi Penentuan Kebutuhan Truk Tangki Pada Proses Distribusi BBM: Studi Kasus TBBM Plumpang. *JISI: Jurnal Integrasi Sistem Industri, 9*(2), 92-102.

[9] Haryono, Y. A. R. (2023). Analysis of the Effectiveness of Route Determination and Distribution of Pertasol in PPSDM Migas (Case Study: PPSDM Migas Cepu). *Swara Patra: Majalah Ilmiah PPSDM Migas, 13*(2), 57-64.

[10] [14] Setyorini, A. D. A., Soimun, A., & Sadri, P. D. A. (2022). Digitalisasi Transportasi dalam Fleet Management System Angkutan Barang. *IWTJ: International Water Transport Journal, 4*(1).

[11] Arip, M., *et al*. (2018). Intermodal freight transport terminal planning in Malaysia: assessing goods transportation and distribution system performance. *Int J Acad Res Bus Soc Sci 8*(11): 1758-1771.

[12] Karim, H. Abdul, *et al*. (2023). *Manajemen transportasi*. Cendikia Mulia Mandiri.

[13] Hart, Abarasi. (2014) A review of technologies for transporting heavy crude oil and bitumen via pipelines. *Journal of Petroleum Exploration and Production Technology 4*, 327-336.

[14] Supriyadi, Didik. (2017). Skenario konsekuensi analisis pengangkutan LNG Semarang-Yogyakarta dengan simulasi ALOHA. *Journal of Science and Applicative Technology* 1.2, 70-74.

[15] Song, Dongping. (2021). A literature review, container shipping supply chain: Planning problems and research opportunities. Logistics 5(2), 41.

[16] Sevkli, Mehmet, *et al*. (2012). Development of a fuzzy ANP based SWOT analysis for the airline industry in Turkey. *Expert systems with Applications 39* (1), 14-24.

[17] Putera, Gery Azhari, and Jerry Heikal. (2021). Business strategy of indah kiat pulp and paper Perawang Mill, Riau, Indonesia using PESTLE, Porter's five forces, and SWOT Analysis under SOSTAC Framework. *International Journal of Scientific Research in Science and Technology 8(*6), 252-270.

[18] Yu, Zhang, *et al*. (2022).Nexuses between crude oil imports, renewable energy, transport services, and technological innovation: a fresh insight from Germany. *Journal of Petroleum Exploration and Production Technology* 12.(1), 2887-2897.